Future needs—clinical services for infectious diseases

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During the last 50 years the subspeciality of clinical infectious diseases has evolved in a number of European countries. The clinical infectious disease physician is now accepted as an established specialist, as is the medical microbiologist. This paper describes the current situation and outlines proposals of a model for the future arrangements for the management of infection.

There is considerable variation in the way patients with infectious diseases are cared for in Europe. In a number of countries, including the Netherlands, the model of care has changed considerably over the years. An early model, still encountered in some centres, is that in which the medical microbiologist is confined to the laboratory, while clinicians take care of patients; there is minimal interaction and consultation between the microbiologist and the clinicians. A slightly more developed model provides some consultation, as diagnostic laboratory findings as well as therapeutic advice is conveyed by note or telephone. A further development is one where the medical microbiologist provides bedside advice about diagnostic procedures and treatment to clinicians; this model is quite prevalent in many of the community hospitals in the Netherlands.

A quite different model is the one in which the microbiologist runs the laboratory and the infectious disease specialist gives advice to clinicians. This particular model is unsatisfactory and can lead to professional conflicts. A better model is that of the medical microbiologist, whilst still running the laboratory, providing bedside advice, and interacting with the infectious disease specialist and other clinicians. In recent years, a number of university hospitals in the Netherlands (especially those in Rotterdam, Utrecht and Nijmegen) have developed this model to create one in which there is strong collaboration between the infectious disease specialist, the medical microbiologist and the hospital infection control service. The hospital pharmacist may further complement this service. Together these specialists create what Dr L Tompkins has called 'the infectious disease service line'. The establishment of similar infectious disease teams of joint expertise of microbiologists and clinicians was proposed by a working party of the Royal College of Physicians and the Royal College of Pathologists in the United Kingdom in 1990 [1]. Such joint expertise should not be restricted to the hospital environment, but should extend outside the hospital so that there is collaboration between the infectious disease specialist, the medical microbiologist, general practioners (especially with regard to antibiotic treatment), public health physicians and health authorities. This creates a powerful model for dealing with the many challenges of infectious diseases.

For the infectious disease clinician, the challenge still remains at the bedside. The diagnostic challenge is whether there is an infection or whether signs and symptoms can be otherwise explained. The differential diagnosis may range from neoplasia to artefact. Should an infection be considered most likely, the etiology may range from helminth to prion. This area of expertise for the infectious disease physician is an important and unique skill that is not part of the training or expertise of most microbiologists.

In addition to the diagnostic challenges are the therapeutic challenges. A large proportion of consultative advice concerns suboptimal antimicrobial treatment; inappropriate choice of antibiotic (often the spectrum being too wide), inadequate dosage, inappropriate duration or route of administration, as well as potentially toxic treatment [2, 3]. To advise or prescribe, taking all aspects of a patient's condition into consideration, is a major area of expertise of the infectious disease physician and includes not only antimicrobial therapy, but also supportive treatment, which may include nutritional support to immunoglobulin therapy. Although evidence-based prescribing is currently emphasized, in many instances robust evidence is lacking. In these cases prescribing of both antimicrobial and supportive therapy becomes an important art that must be acquired.

A further challenge for the infectious disease physician concerns the prevention of infection. Implementation of good hospital hygiene practice is an area that must not be neglected by the infectious disease physician, who should be an example for other physicians and healthcare workers, particularly with hand hygiene. The same holds true for compliance with isolation procedures; even including simple measures such as wearing a clean white coat and not sitting on hospital beds. The

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infectious disease physician should not be afraid to correct and educate other healthcare workers.

Another important area of expertise is the prevention of infectious disease. The infectious disease physician should be an expert in vaccination policies, and be able to give advice to patients as well as travel advice to the public. The need for such expertise will increase as new vaccines are developed. Allied to the prevention of infection is knowledge in the use of antibiotic prophylaxis. Concerns about misuse are an important area of concern. This is particularly the case with surgical prophylaxis (e.g. wrong timing, wrong drugs, too many dosages) [4, ›5], but also extends to controversial areas of application such as selective decontamination of the digestive tract in intensive care patients.

The new challenges for the infectious disease specialist are manifold. First of all, there are the emerging and re-emerging pathogens. In addition, there is the global increase in antimicrobial resistance, which is occurring in the face of a dearth in the development of new antibacterial drugs. Thus, many of the emerging pathogens must be treated with established antimicrobial drugs. This will only remain possible if the standard of prescribing and compliance with hospital hygiene improves [6]. At the same time there is a revolution happening in diagnostic medical microbiology, with rapid and often molecular-based tests appearing. The clinical application of many of these new tests is unclear at the moment, yet there will need to be profound changes in the ordering of tests and also in turn the way clinical decision-making is conducted. The infectious disease specialist should be involved in the critical evaluation of these new tests, as there is a danger that inexperienced physicians will rely more heavily on the results of such tests and less on clinical judgement. The increasing number of patients with severe host defence defects poses a particular challenge. There is an urgent need for new techniques to assess the state of host defences. This is particularly so with the advent of the new immunotherapeutic management of infection.

What should the profile of the infectious disease specialist be? First of all, he or she should be clinically well trained in internal medicine or in pediatrics. Subspeciality training should encompass clinical infectious diseases, practical skills in diagnostic medical microbiology, training in epidemiology, public health and hygiene, and also research training. Tropical infectious diseases should also be included in the training program. Much weight should be given to the etiology, pathogenesis, diagnosis, and management of infectious diseases. The trainee should be fully conversant with the therapeutic aspect of disease management including the pharmacology of antimicrobial drugs, antibiotic policies, prescribing, and supportive care. Likewise, approaches to prevention (hygiene and vaccination strategies) should be fully mastered.

Such training programs are very demanding. The total duration of medical training, i.e. medical studies, speciality training and subspeciality training is particularly long in the Netherlands. The issue of whether training programs should be shortened is currently under discussion. In some countries (e.g. the United States), developments are taking place which create serious threats for the infectious disease service. One such concern is that in the USA the medically qualified microbiologist is extremely rare; most laboratories are run by science graduates.

The development of commercial diagnostic microbiology laboratories located at a distance from the hospital raises further concerns. Both developments interfere with the fundamental concept of the 'infectious disease service line' and present new challenges to the quality of care for the patient with infectious disease. It is important that all such challenges are addressed in a rapidly changing world.

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